WHAT IS CLAIMED IS:

1. A method of manufacturing an electrode structure comprising: coating a compound mixture composed of an electrode material, binder, and solvent onto a current-collecting member, directing infrared radiation onto the compound mixture coating to vaporize the solvent and to form an electrode film on the current-collecting member.

2. A method of manufacturing an electrode structure comprising: coating a compound mixture composed of an electrode material covered with ion-conducting polymer and a solvent, onto a current-collecting member, directing infrared radiation onto the compound mixture coating to vaporize the solvent and to form an electrode film on the current-collecting member.

3. An electrode structure manufacturing method according to claim 1 or claim 2, wherein said compound mixture also contains a powdered electrically-conducting substance.

4. The method of claims 1 or 2 wherein said electrode material is a material having a large surface area.

5. The method of claim 4 wherein said compound mixture also contains a powdered electrically-conducting substance.

6. The method of claims 1 or 2 wherein said electrode material is in particulate form.

7. The method of claims 1 or 2 wherein said electrode material is a chalcogen.

8. The method of claim 7 wherein said chalcogen is selected from the group consisting of FeS_2, TiS_2, MoS_2, V_2O_5, V_6O_{13}, MnO_2 and mixtures thereof.

9. The method of claim 7 wherein said chalcogen compounds contain lithium.

10. The method of claim 9 wherein said lithium-containing chalcogen compounds is $LicoO_2$.

11. The method of claim 9 wherein said lithium-containing chalcogen compound has the formula $Li_xNi_yM_{1-y}O_2$, where M is one or more metallic elements selected from transition metals and aluminum and $0.05 \leq x \leq 1.10$ and $0.5 \leq y \leq 0$.

12. The method of claim 11 wherein said transition metals are selected from the group consisting of cobalt, manganese, titanium, chromium, and vanadium.

13. The method of claim 9 wherein said lithium-containing chalcogen compounds are selected from the group consisting of $LiNiO_2$, $LiMnO_2$, and $LiMn_2O_4$.

14. The method of claims 1 or 2 wherein said electrode structure is a positive electrode.

15. The method of claims 1 or 2 wherein said electrode structure is a negative electrode.

16. The method of claim 15 wherein said electrode material is selected from the group consisting of a lithium metal, a lithium metal alloys, and carbon.

17. The method of claim 16 wherein said electrode material is carbon selected from the group consisting of pyrolitic carbon, pitch coke, needle coke, petroleum coke, graphite, carbon glass, and carbonized macromolecular compounds.

18. The method of claim 15 wherein said electrode material comprises π-conjugated conductive macromolecular materials.

19. The method of claim 3 wherein said powdered electrically-conducting substance is selected from a metal powder, carbon powder and mixtures thereof.

20. The method of claim 2 wherein said ion-conducting polymer contains at least 0.1

moles/L of a dissolved lithium salt.

21. The method of claim 2 wherein said electrode material is covered with said ion-conducting material by mixing the ion-conducting polymer or precursor thereof with a powdered electrode material and pressing the ion-conducting polymer or precursor thereof and the powdered electrode material together by a sliding action.

22. A battery comprising a positive electrode and a negative electrode spaced from each other, and an electrolyte positioned between said positive and negative electrodes, at least one of said positive or negative electrodes formed by the method of claim 3.

23. The battery of claim 22 wherein said both said positive and negative electrodes are formed by the method of claim 3.

24. The battery of claim 22 wherein said electrolytic is a fluid.

25. The battery of claim 22 wherein said electrolyte is a solid.

26. A double layer capacitor comprising at least one pair of spaced electrodes and an electrolyte placed between said pair of electrodes, at least one of said electrodes of said one pair of electrodes is formed by the a method of claim 427. The double-layer capacitor of claim 26 wherein each electrode of said pair of electrodes is formed by the method of claim 4.

28. The double-layer capacitor of claim 26 wherein said electrolyte is a liquid electrolyte.

29. The double-layer capacitor of claim 26 wherein said electrolyte is a solid.

30. The double-layer capacitor of claim 26 wherein said large surface area material is coated with an ion-conducting polymer and wherein said compound mixture further includes a powdered electrically-conducting substance.

31. An electrode structure formed by the method of claims 1 or 2.

32. An electrode structure formed by the method of claim 3.

33. A method of manufacturing a battery containing spaced positive and negative electrodes, wherein at least one of said electrodes is formed by coating a compound mixture composed of a powdered electrode active substance, powdered electrically-conducting substance, binder and solvent onto a current-collecting member, directing infrared radiation onto the coating to vaporize the solvent and to form an electrode film on the current-collecting member to constitute the electrode structure, and placing an electrolyte between said spaced electrodes.

34. The method of manufacturing a battery as in claim 33 wherein said powdered electrode active substance is coated with an ion-conducting polymer.

35. A method of manufacturing an electrical double-layer capacitor containing spaced electrodes, wherein at least one of said electrodes is formed by coating a compound mixture composed of a large surface area material, binder and solvent onto a current-collecting member, directing infrared radiation onto the coating to vaporize the solvent and to form an electrode film on the current-collecting member to constitute the electrode structure, and placing an electrolyte substance between said spaced electrodes.

36. The method of manufacturing an electrical double-layer capacitor as in claim 35 wherein said large surface area material is coated with an ion-conducting polymer.

37. A method of manufacturing an electrode structure comprising: coating a compound mixture composed of an electrode material, binder, and solvent onto a current-collecting member, vaporizing the solvent, and forming an

electrode film on the current-collecting member.

38. A method of manufacturing an electrode structure comprising: coating a compound mixture composed of an electrode material covered with ion-conducting polymer and a solvent, onto a current-collecting member, vaporizing the solvent, and forming an electrode film on the current-collecting member.

39. A method of manufacturing an electrode structure by coating a compound mixture comprising an electrode material, binder, and solvent onto a current-collecting member, directing infrared radiation onto the compound mixture coating to vaporize the solvent and form an electrode film on the current-collecting member.

40. A method of manufacturing an electrode structure by coating a compound mixture comprising an electrode material covered with an ion-conducting polymer and a solvent, onto a current-collecting member, directing infrared radiation onto the compound mixture coating to vaporize the solvent and form an electrode film on the current-collecting member.

41. The electrode structure manufacturing method according to claim 39 or 40, wherein the compound mixture also contains a powdered electrically-conducting substance.

42. A method of manufacturing a battery with the electrode structures as the battery electrodes, wherein a compound mixture comprising a powdered electrode active substance, powdered electrically-conducting substance, binder and solvent is coated onto a current-collecting member, infrared radiation is directed onto the coating of mixed material to vaporize the solvent and to form an electrode film on the current-collecting member to constitute the electrode structure.

43. A method of manufacturing a battery with the electrode structures as battery electrodes, wherein a compound mixture comprising a powdered electrode active substance coated with ion-conducting polymer, powdered electrically-conducting substance, and solvent is coated onto a current-collecting member, infrared radiation is directed onto the coating of mixed material to vaporize the solvent and to form an electrode film on the current-collecting member to constitute the electrode structure.

44. A method of manufacturing an electrical double-layer capacitor with the electrode structures as described above used as the capacitor electrodes, wherein a compound mixture comprising a large surface area material, binder and solvent is coated onto a current-collecting member, infrared radiation is directed onto the coating of mixed material to vaporize the solvent and to form an electrode film on the current-collecting member to constitute the electrode structure.

45. A method of manufacturing an electrical dual-layer capacitor with the electrode structures as above described used as the capacitor electrodes, wherein a compound mixture comprising a large surface area material coated with an ion-conducting polymer and a powdered electrically-conducting substance and solvent is coated onto a current-collecting member, infrared radiation is directed onto the coating of mixed material to vaporize the solvent and to form an electrode film on the current-collecting member to constitute the electrode structure.